REM II

PERFORMANCE OF REMEDIAL RESPONSE ACTIVITIES AT UNCONTROLLED HAZARDOUS WASTE SITES

U.S. EPA CONTRACT NO. 68-01-6939

CAMP DRESSER & McKEE INC.
ROY F. WESTON, INC.
WOODWARD-CLYDE CONSULTANTS
CLEMENT ASSOCIATES, INC.
ICF INCORPORATED
C. C. JOHNSON & ASSOCIATES, INC.

South Cavalcade
Drilling Evaluation

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Section

CAMP DRESSER & McKEE INC.

MEMORANDUM

TO: Robert S. Kier

FROM: Tony R. St. Clair

PROJECT: REM II - EPA Contract No.: 68-01-6939

SUBJECT: South Cavalcade Drilling Evaluation

DOCUMENT NUMBER: 143-TS1-IO-BVAT-1

DATE: October 21, 1985

002079

On October 10 and 11, 1985, I was in Houston to observe a test drilling program conducted by McBride-Ratcliff and Associates, Inc. (MRA). The test was to be performed in order to determine which method, mud-rotary or hollow stem, would be better suited for monitor well installation and subsurface sampling at the South Cavalcade site. Two drilling contractors were used for the test; Vann and Sons, Inc. for the mud-rotary method, and Custom Coring, Inc. for the hollow stem method.

On the first day, Vann and Sons, Inc. set up their truck mounted mud-rotary rig on the esplanade between the eastbound and westbound lanes of Cavalcade Street. Those present to witness the drilling, in addition to myself and the drilling team, were: (1) Bill Tobin, MRA, (2) Paul Moore, MRA, and (3) John Cochran, EPA. The driller's plan was to begin their sampling using a standard Shelby tube with a 24-inch push and then, after setting a surface casing, to begin water circulation. After successful sampling of the clay in the five to ten foot region it was decided that, because of the high clay content and proximity of the sand layer, the water circulation was not needed. This decision was based on a old drilling log which showed a single sand layer at about 15 feet. The drillers and MRA decided that a steel casing extended to seal off the sand layer should suffice. This worked well until other sand layers were found beneath the first so more casing had to be continually added. This caused a problem in that there were so many collar fittings on the casing that it was difficult to insert and remove the casing. The casing was finally set at 33 feet and clay was sampled to 50 feet.

While this method was relatively fast, there were problems associated with driving the casing at the deeper levels. No major problems were encountered while sampling with either the Shelby tube or the split-

spoon samplers. Recovery on nearly all samples was high and it was fairly easy to determine at what levels the stratigraphy changed. This method is essentially the same as hollow stem augering except that the casing is advanced only far enough to seal off the lowest sands; while this may be satisfactory for sampling, it could have limitations for well installations.

On the second day, Custom Coring, Inc. came to try hollow stem augering at nearly the same spot as the day before. Bill Tobin and John Cochran were not present this day. Custom Coring's rig was mounted on a "mud buggy" and, while tremedously oversized for this job, would perform well in muddy areas or locations were access with a small tired vehicle would be limited. This team used a thin-walled Acker tube for sampling the clay and in several cases the tubes were ruined because they could not stand up to the pressure of being forced into the stiff clay. Samples were easy to take with their rig setup but they once had a problem of extracting the sampler from the ground.

This method took considerably longer to do the job and, because of the bulk of the five-foot auger flights, was more strenuous. Recovery was about the same as with other methods and no major problems were encountered.

Both methods provided samples of about the same quality but for well installation the hollow stem is preferred. However, since the mud-rotary technique was never used the true objective of the test was not accomplished.

I also have for your information a copy of the drilling logs and a pictorial summary of the work that was performed during these two days.

Appendix A

Guide to Photographs

Photo 1. - Vann and Sons, Inc. drilling rig on esplanade.

Photo 2. - First sample taken using the Shelby tube.

Photo 3. - Clay sample being removed from tube using hydraulic extruder.

Photo 4. - Clay sample taken at eight to ten feet.

Photo 5. - Steel casing being pushed into place.

Photo 6. - Sample taken at 33 to 35 feet (end of casing).

Photo 7. - Custom Coring, Inc. drilling rig on esplanade.

Photo 8. - Mast raised and ready for sampling.

Photo 9. - First sample taken using the Acker tube.

Photo 10. - This tube has been ruined by being forced into the clay.

Photo 11. - Advancing the continuous flight.

Photo 12. - Sand sample taken with a split-spoon at 14 to 16 feet.

Photo 13. - Last sample being removed at 45 feet.

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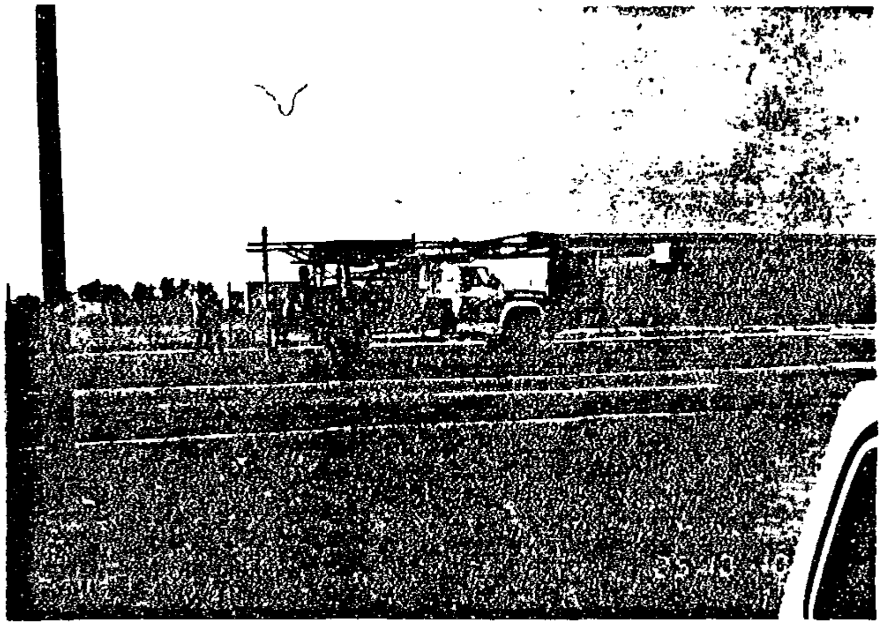

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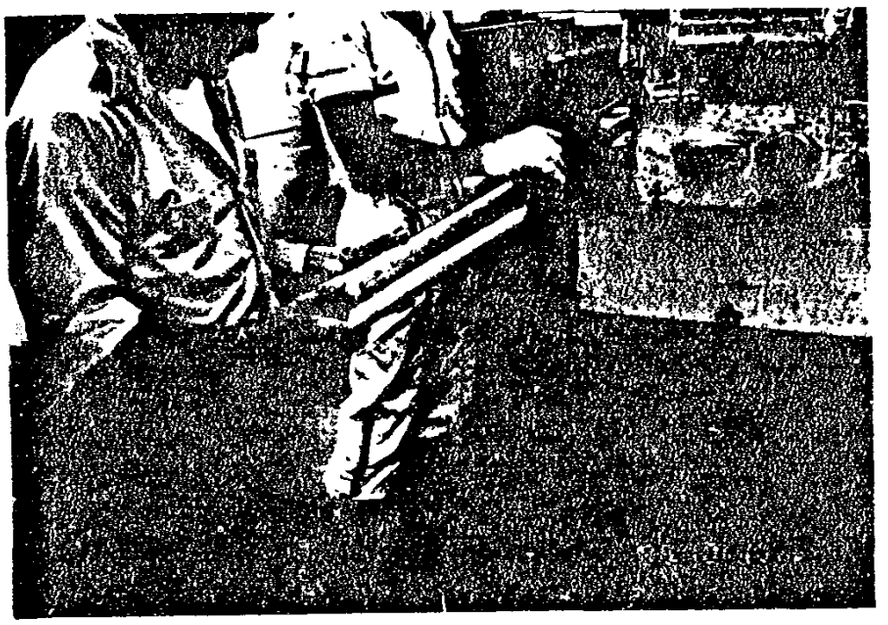

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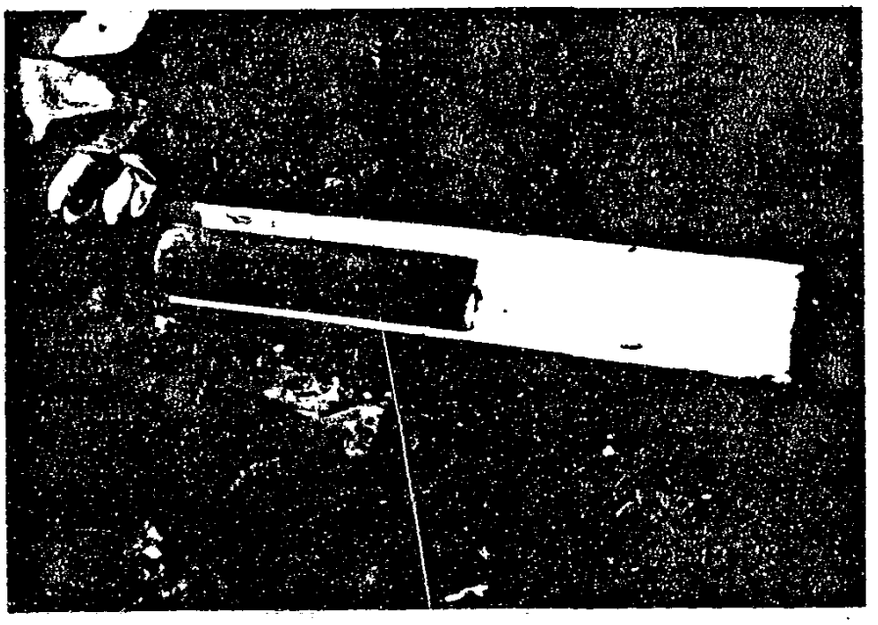

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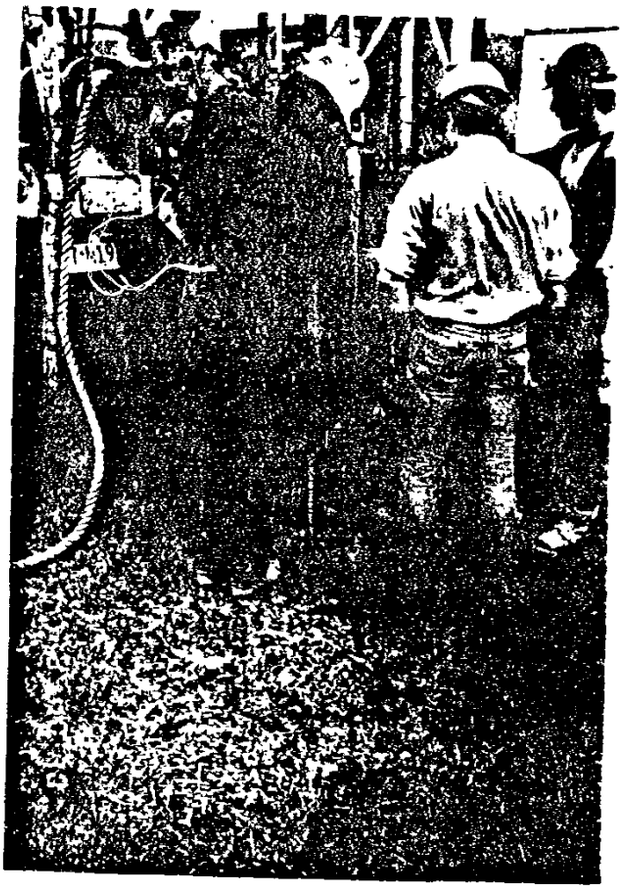

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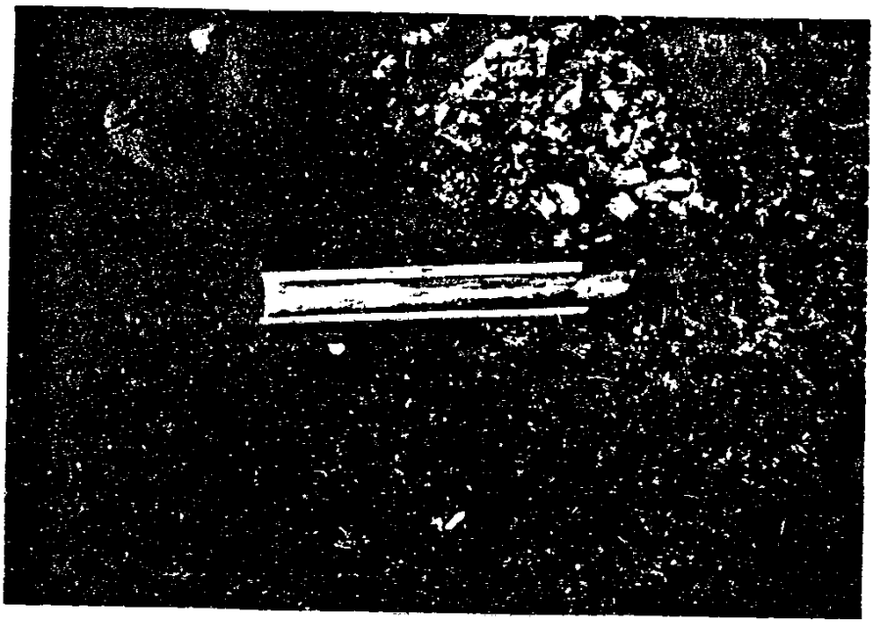

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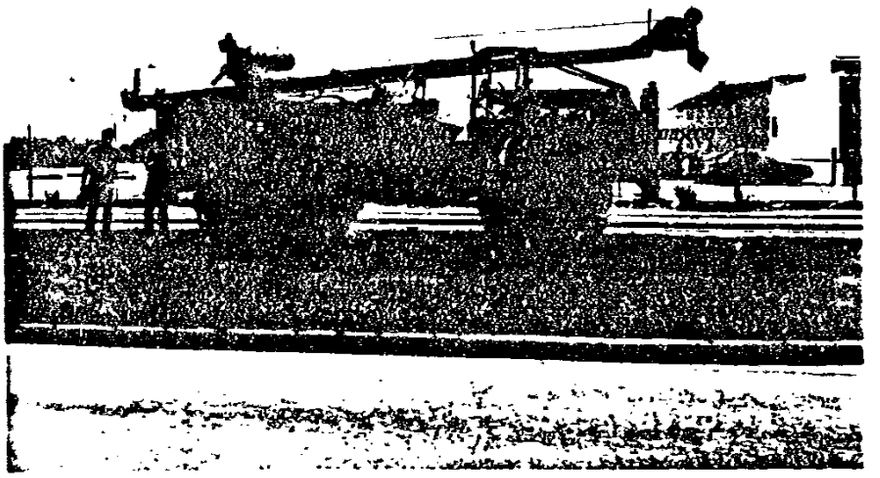

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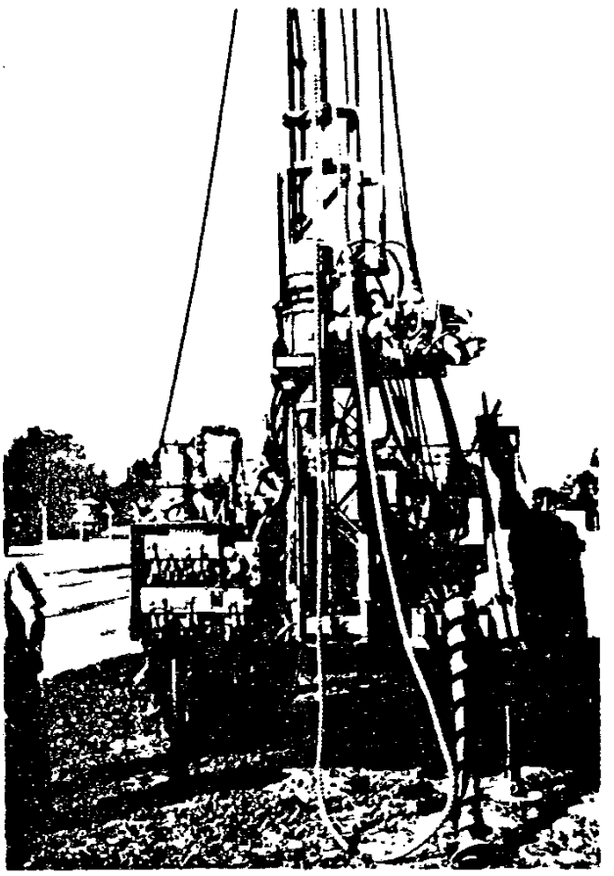

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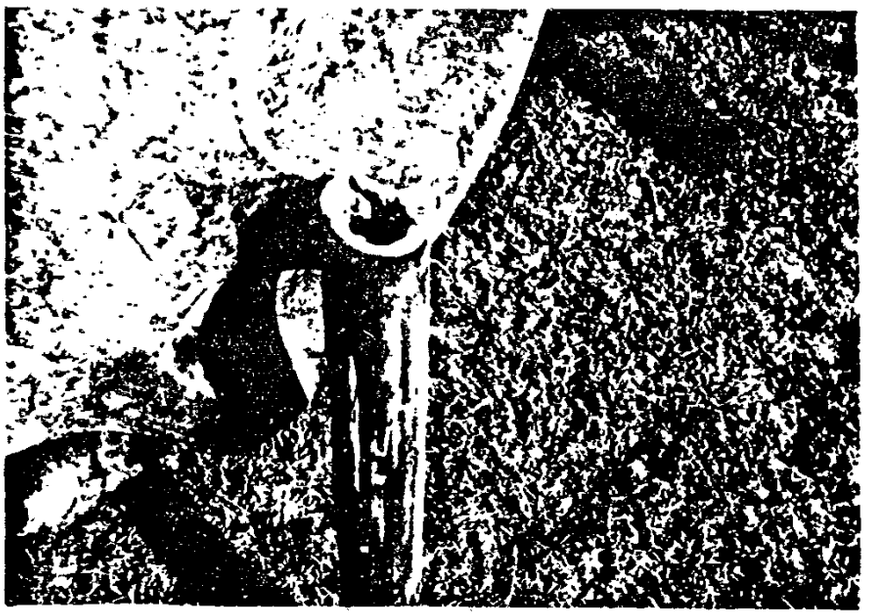

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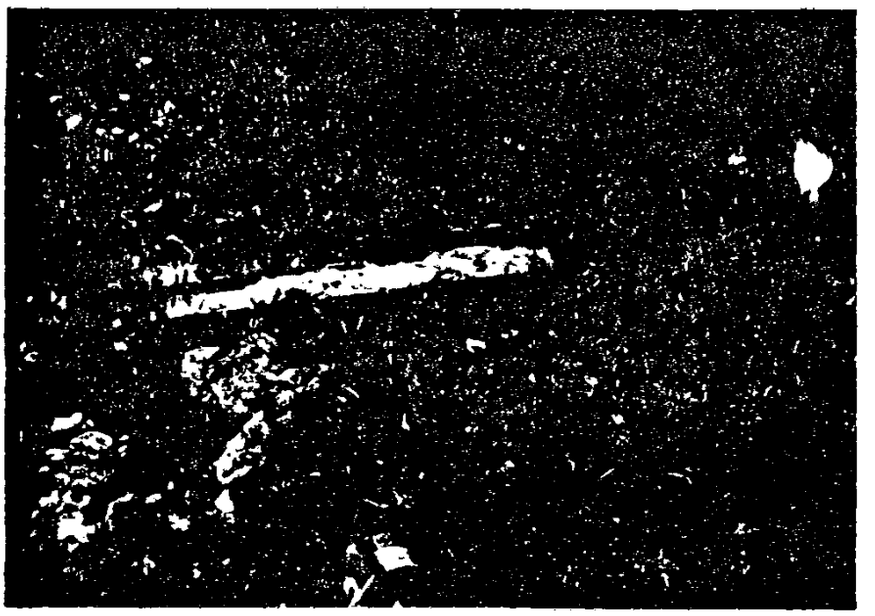

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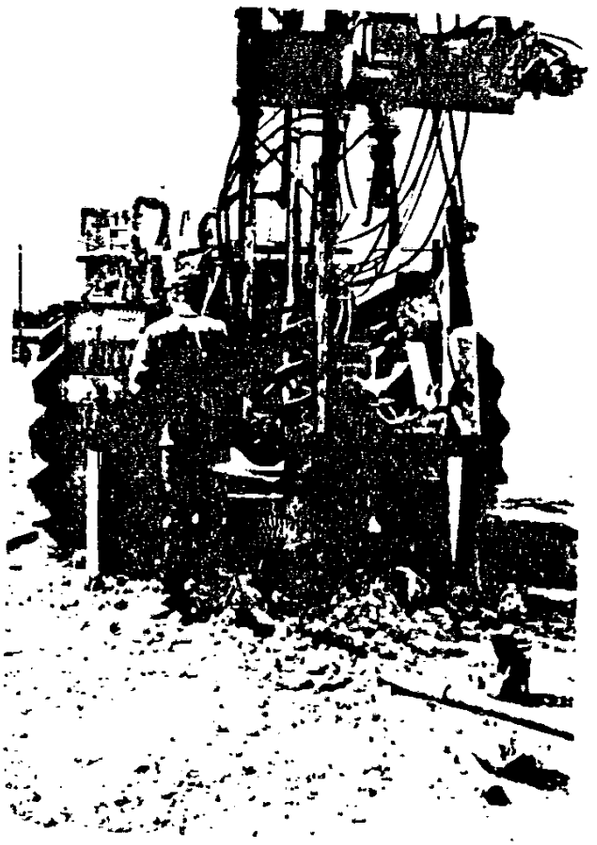

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Appendix E

LOG OF BORINGS

9:00

JOB NO.: 85-317
PROJECT: S Cavalcade St
CLIENT:

BORING NO.: TB-1
DATE: 10/10/85
TECHNICIAN: P.C. [illegible]
DRILL CONTRACTOR: V3S

WATER LEVEL DATA:
TIME (MIN.) VS DEPTH (FT.)
5 ______
10 ______
15 ______
END OF DAY ______
24 HRS ______

FREE WATER DEPTH ______

METHOD OF ADVANCE:
AUGER ______ TO ______
WASH ______ TO ______

DEPTH FEET	SAMPLE SYMBOL	CORE (C)/JAR (J)	HAND PENETROMETER RDG. / BLOW COUNTS	CONSISTENCY	COLOR	MINOR MATERIAL	MAJOR MATERIAL	CHARACTERISTICS OF MODIFICATIONS
0					G	Sa	Si	Fill
					G	"		[illegible], roots
5					G	v Sa-Si	Cl	w/ [illegible] Fe Nods
					L-G	Sa	Cl	[illegible] w/ Fe Nods
					"	"	"	w/ Fe Nod
10			7/3/4	L	[illegible]	S/Si, vSi[illegible]	f Sa	wet
			5/7/14	F	"	"	"	v wet
15			6/5/7	F	[illegible] T		Sa	
					RB-L		Cl	[illegible]
					"		"	
20								
					SL		Sa	wet
					RB-L		Cl	
25			10/14/15	F	RB	Cl	Si	grades to a si [illegible] 22.5
					"		Si	
					"	Sa	Si	grades to cl si then si cl w/ calc. nods
30					RB-L		Cl	w/ sa & si int., calc nods, fissil
					"		"	S/S, fissil calc. nod [illegible]
					L-T	Sa	Cl	
35					"	Si "	"	w/ small sa filled fiss., [illegible] (Mont. Fm?) casing to 33'
40								

water soil

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MCBRIDE-RATCLIFF AND ASSOCIATES, INC.

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LOG OF BORINGS

JOB NO.: _____ BORING NO.: _____

PROJECT: DATE: _____

CLIENT: TECHNICIAN: _____

DRILL CONTRACTOR: _____

WATER LEVEL DATA: FREE WATER DEPTH _____

TIME (MIN.) VS DEPTH (FT.)

5 _____

10 _____

15 _____

END OF DAY _____

24 HRS _____

METHOD OF ADVANCE:

AUGER _____ TO _____

WASH _____ TO _____

DEPTH FEET	SAMPLE SYMBOL	CORE (C) / JAR (J)	HAND PENETROMETER RDG. / BLOW COUNTS	CONSISTENCY	COLOR	MINOR MATERIAL	MAJOR MATERIAL	CHARACTERISTICS OR MODIFICATIONS
40					RB; L		Cl	
46					M; L	Cl	Si	wet
					RB; L		Cl	
					RB		Si	w/cl pkts i int.b.
50		23/31/37			TD = 50'			

MCBRIDE-RATCLIFF AND ASSOCIATES, INC.

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LOG OF BORINGS

JOB NO.:	BORING NO.: TB-2
PROJECT:	DATE: 10/11/85
CLIENT:	TECHNICIAN: P.C. Moore
	DRILL CONTRACTOR: CC

WATER LEVEL DATA: FREE WATER DEPTH ______

TIME (MIN.) VS DEPTH (FT.)

TIME (MIN.)	DEPTH (FT.)
5	
10	
15	
END OF DAY	
24 HRS	

METHOD OF ADVANCE:

AUGER ______ TO ______

WASH ______ TO ______

10'-

DEPTH FEET	SAMPLE SYMBOL	CORE (C)/JAR (J)	HAND PENETROMETER RDG / BLOW COUNTS	CONSISTENCY	COLOR	MINOR MATERIAL	MAJOR MATERIAL	CHARACTERISTICS OR MODIFICATIONS
0					G	Cl	Sa	Fill w/ conc. & shell
					G	VSa	Cl	In situ w/ vert sa filled fiss.
5					LtT	Sa	Cl	w/ vert sa filled fiss. Fe nod.
					"	"	"	w/ vert sa fiss & part. Fe nods
					"	"	"	
10					G	Cl	Sa	w/ vst ifedods
					"	Si	Sa	grades to a si sa w/ cl seds
					"	"	"	
					"	"	"	wet
15					RB; L		Cl	a sa cl @ 15' for 1" s/s
					L; RB		"	
20					L/Bra		F Sa	w/ si inth
					LBra		Si	w/ cl in th. & cal.
					L; RB		Cl	
25					RB		Cl	
					m; L		"	s/s
30								
					LtT	Sa	Cl	
35								
					"	"	"	
40								

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LOG OF BORINGS

JOB NO.: _____ BORING NO.: TB-2

PROJECT: DATE: 10/10/95

CLIENT: TECHNICIAN: P.C. Mertz

DRILL CONTRACTOR: CC

WATER LEVEL DATA: FREE WATER DEPTH _____

TIME (MIN.) VS DEPTH (FT.)

5 _____

10 _____

15 _____

END OF DAY _____

24 HRS _____

METHOD OF ADVANCE:

AUGER _____ TO _____

WASH _____ TO _____

DEPTH FEET	SAMPLE SYMBOL	CORE (C) / JAR (J)	HAND PENETROMETER RDG. / BLOW COUNTS	CONSISTENCY	COLOR	MINOR MATERIAL	MAJOR MATERIAL	CHARACTERISTICS OR MODIFICATIONS
40					L:T	Sa	Cl	bio-turb w/small vert Sa strs
45					M:L	"	"	w/Sa pockets & lenses
					RB:L		Cl	w/calc. nods
						TD=47'		
50								

MCBRIDE-RATCLIFF AND ASSOCIATES, INC.

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